

ABSTRACT

Nuclear and Atomic Physics **STAR DETECTOR CONSTRUCTION AND LIGHT YIELD MEASUREMENTS**

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The Solenoidal Tracker at RHIC (STAR) is one of the detectors at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven Labs, NY. STAR will study, among other subjects, the polarized gluon contribution to the spin of the proton. The Endcap Electromagnetic Calorimeter (EEMC) for STAR increases the angular range for triggering and particle detection, especially important for spin measurements. The shower-max detector (SMD) is positioned inside the EEMC such that the maximum of the electromagnetic shower hits the SMD. It will be used for finely tuned position determination, and will distinguish π^0 from γ particles.

The SMD is constructed of extruded scintillator plastic strips that are glued in 30° pie-shaped modules with wavelength shifting (WLS) optical fiber readout. Particles passing through the SMD deposit energy in the scintillator, which is then carried by the WLS fibers to clear optical fibers and then an electronic PMT box.

The first of the modules were constructed, and light yield measurements were conducted on samples of the scintillator strips. Construction consisted of wrapping the strips in reflective Mylar, then cutting and gluing the strips into the module shape. Samples of the strips were tested using a radioactive ruthenium source (^{106}Ru). Light yield tests included testing strips for amount of light yield, light yield variation over short distances, and light yield of strips with imperfections.